

**IN THE CLAIMS:**

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently Amended) A method comprising:

modeling a circadian rhythm having a first sinusoidal curve with a 24 hour period and a second sinusoidal curve with a 12 hour period using a processor,

calculating a cognitive level of a person using a processor based on the person's sleep/wake data received from an actigraph or a polysomnography system,

calculating a predicted cognitive performance based on said circadian rhythm and said cognitive level using a processor.

2. (Currently Amended) A system comprising:

at least one input device for ~~entering~~ receiving sleep/wake data,

a microprocessor including

means for modeling a circadian rhythm,

means for ~~calculating~~ determining a cognitive level of a person based on the person's sleep/wake data, and

means for calculating a predicted cognitive performance based on said circadian rhythm and said cognitive level, and

a display to show the predicted cognitive performance.

3. (Currently Amended) A computer-readable medium having computer-executable instructions for predicting a cognitive performance level of an individual, the computer-executable instructions comprising:

first program instruction means for modeling a circadian rhythm,

second program instruction means for ~~calculating~~ determining a cognitive level of a person based on the person's sleep/wake data, and

third program instruction means for calculating a predicted cognitive performance based on said circadian rhythm and said cognitive level.

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35. (Currently Amended) A method for providing a cognitive performance level comprising:

receiving a data series representing at least one wake state and at least one sleep state an actigraph or a polysomnography system,

selecting a function based on the data series, wherein the function is selected from a group consisting of a wake function, a sleep function, and a sleep inertia function, where

the wake function is expressed as follows

$$w(t) = C_{t-1} - k_w$$

where  $k_w$  is a positive function,

the sleep function is expressed as follows

$$s(t) = C_{t-1} + (100 - C_{t-1}) / k_s$$

where  $k_s$  is a time constant, and

the sleep inertia function is expressed as follows

$$i(t) = C_{sw} * [0.75 + 0.025 (t - t_{LS}) - (0.025 (t - t_{LS}))^2]$$

where  $t_{LS}$  is time when the last sleep state occurred and  $C_{sw}$  is the cognitive level at the last sleep state,

determining a cognitive performance capacity using the selected function using a processor,

modulating the cognitive performance capacity with a time of day value using a processor, and

providing the modulated value.

36. (Cancelled)

37. (New) The system according to claim 2, wherein said input device is in communication with an actigraph.

38. (New) The system according to claim 2, wherein said input device is in communication with a polysomnography system.

39. (New) The system according to claim 2, wherein said sleep/wake data contains a series of epochs where each epoch is classified as sleep or wake.

40. (New) The system according to claim 2, wherein the circadian rhythm has a first sinusoidal curve with a 24 hour period and a second sinusoidal curve with a 12 hour period.

41. (New) The system according to claim 2, wherein the person's sleep/wake data includes a series of epochs where each epoch is classified as sleep or wake,

said means for calculating the predicted cognitive performance performs the calculation for each epoch of data.

42. (New) The computer-readable medium according to claim 3, wherein the circadian rhythm has a first sinusoidal curve with a 24 hour period and a second sinusoidal curve with a 12 hour period.

43. (New) The computer-readable medium according to claim 3, wherein the person's sleep/wake data includes a series of epochs where each epoch is classified as sleep or wake,

said third program instructions means for calculating the predicted cognitive performance performs the calculation for each epoch of data.

44. (New) The method according to claim 1, wherein said sleep/wake data contains a series of epochs where each epoch is classified as sleep or wake.